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ATLAS
OF
PATHOLOGICAL ANATOMY
ILLUSTRATIVE OF
A CLINICAL TREATISE
ON
DISEASES OF THE LIVER

BY
DR. FRIED. THEOD. FRERICHS,
PROFESSOR OF CLINICAL MEDICINE, FORMERLY IN THE UNIVERSITY OF Breslau, AND NOW IN THE
UNIVERSITY OF BERLIN, &c. &c.

PART I.
CONTAINING TWELVE CAREFULLY COLOURED STEEL ENGRAVINGS.

TRANSLATED AND EDITED

BY
CHARLES MURCHISON, M. D.
FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

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EDITOR'S PREFACE.

This English Edition of the Atlas has been published by Messrs. Vieweg and Son of Brunswick, for the benefit of the members of the New-Sydenham-Society. The references contained in it correspond to the pages of the first volume of the English Edition of Professor Frerichs's Clinical Treatise on Diseases of the Liver. An English Edition of the Atlas, illustrative of the Second Volume, will likewise shortly be published.

London, January 1861.

CHARLES MURCHISON.

P L A T E I.

JAUNDICE OF THE LIVER, KIDNEYS, SKIN &c.

- Fig. 1. Section of the Liver in a case of Retention of Bile, resulting from closure of the Ductus choledochus. The parenchyma is coloured brownish-green, and the centre of the lobules, brownish-black; the bile-ducts are considerably enlarged; their gaping walls and the tissue which envelopes them appear considerably thickened. (Case of Schmidt. Vol. I, page 151.)
- Fig. 2. Thin section of the same liver magnified 80 diameters. The bile-pigment is accumulated chiefly in the neighbourhood of the central veins; dark brown granules are seen scattered through the parenchyma, which, under a higher magnifying power, were found to consist partly of hepatic cells impregnated with colouring matter, and partly of globular or branched deposits of bile (Fig. 4). The walls of the bile-ducts are remarkably thickened (*a* and *b*); close to them, at many places, such as at *b*, are round or elongated bodies of a brown colour, which apparently corresponded to the finest bile-ducts filled with stagnant bile.
- Fig. 3. Hepatic cells impregnated with bile; most of them contain yellow or brown granules partly isolated, and partly aggregated in dense masses; in a few of the cells only is the nucleus visible; other cells contain extensive deposits of a globular, angular, or rod-like (*stengel-artig*), form, and of a yellow, brown or green colour. In a few of the cells the colouring matter is uniformly distributed. The nucleus, in the cells where it is visible, is in some instances pale, and in others of a greenish or yellowish tinge.
- Fig. 4. Globular, rod-like and partly branched deposits of bile, of a yellow, brown, ochre and green colour. At the lower part of the figure, one of the globular masses is represented which has been crushed by pressure, and there is another which is cleft.
- Fig. 5. A portion of jaundiced skin. The pigment is situated principally in the cells of the "rete Malpighii."
- Fig. 6. A portion of a sweat-gland from the axillary cavity of a jaundiced patient. The gland is filled with molecules and large granules of a brownish-yellow colour. The cells of the surrounding adipose tissue are of an unusually dark-yellow tint.
- Fig. 7. Bile-pigment in a crystalline form, obtained from the ethereal extract of concentrated bile from the gall-bladder.

- Fig. 8. Malpighian capsule and commencement of a uriniferous tube from a man who died in consequence of closure of the ductus choledochus. (Case of Bohle, Observation VI. Vol. I, p. 139.) The capsule is of a greenish tint, whilst the nuclei of the epithelium cells are brownish-black, from the deposit of bile-pigment.
- Fig. 9. A group of uriniferous tubes from the pyramids of the same kidney. They are partly of a brown, and partly, of a green colour; two of them are completely blocked up by an accumulation of brownish-black crumbling masses.
- Fig. 10. Two fragments of uriniferous tubes from the cortical portion of the kidney. The basement-membrane is of a dirty green colour; the nuclei of the glandular epithelium appear brownish-black.
- Fig. 11. Two other pieces of uriniferous tubes from the same kidney. The basement-membrane is folded at some places and of a sap-green colour; the nuclei of the glandular epithelium are dark-brown.
- Fig. 12. Glandular epithelium-cells from the same kidney.
- a* Nuclei and young cells of a dirty-yellow, greenish-brown, or reddish-brown colour.
 - b* Glandular epithelium-cells, with pigment deposited in concentric layers around the nucleus, and on the inner surface of the cell-wall.
 - c* Large epithelium-cells, of a greenish, brownish and red colour. Some of the cells are in a state of granular degeneration and of a reddish, brown, or black colour.
 - d* Scaly (schollenartig) deposits of pigment of a brown or black hue, and some of them hard and angular, from the uriniferous tubes.
-

PLATE II.

ACUTE ATROPHY OF THE LIVER. THE CRYSTALLINE FORMS OF LEUCINE AND TYROSINE.

- Fig. 1. The softened parenchyma of the Liver.
a Needle-shaped crystals of Tyrosine.
b Debris of the hepatic cells.
- Fig. 2. Blood from the hepatic veins.
a Crystals of Tyrosine.
b Normal blood-corpuscles.
- Fig. 3. Crystals of Tyrosine, which separated from a decoction of the liver, after cooling.
a Solid crystalline matter, tinged with colouring-matter.
b Needle-shaped crystals.
- Fig. 4. A portion of hepatic parenchyma, infiltrated with crystals of Tyrosine and Leucine, from a case of softening, consecutive upon obstruction of the bile-ducts. (Case of Bloch, Observ. XIX. Vol. I, p. 238.)
- Fig. 5. Crystals of Tyrosine from the walls of the hepatic veins of the same liver.
- Fig. 6. Another fragment of the parenchyma of the same liver.
a Branches of the hepatic veins filled with Leucine and Tyrosine.
b Enlarged bile-ducts filled with brown bile.
c Hepatic parenchyma with crystalline plates of cholesterine.
- Fig. 7. *a* Crystals of Leucine from a cirrhotic Fatty-liver.
b Leucine from the liver of a patient who died of Typhus.
- Fig. 8. *a* Leucine from a liver, which had undergone softening in consequence of obstruction of the bile-ducts. (Case of Bloch, Observ. XIX. Vol. I, p. 238.)
b Leucine and Tyrosine from the same liver.
- Fig. 9. *a* A crystalline membrane composed of Leucine from the same liver.
b Leucine and Tyrosine from the same liver.
- Fig. 10. Leucine from the liver of a patient who had died of Pyæmia.
a A large, laminated, globular mass.
b Smaller masses.

- Fig. 11. Leucine from the urine of a Typhus patient.
 a Floating upon the residue of the urine after treatment with the basic acetate of lead.
 a' The same after treatment with acetic acid.
 b From the urine, after further evaporation.
 b' The same after treatment with acetic acid.
- Fig. 12. Leucine obtained from the urine of a dog, after injectiing this substance into the veins.
- Fig. 13. Leucine from the bile of a Typhus patient.
 a From the sediment of the bile.
 b From the residue, after the treatment with acetate of lead.
-

P L A T E III.

ACUTE ATROPHY OF THE LIVER. LEUCINE AND TYROSINE FROM THE SECRETIONS.

Figs. 1 and 2. Sections of the Liver in the condition of Acute Atrophy.

Fig. 1. Section of the right lobe, at the commencement of the process. The liver is hyperæmic and, at some places, ecchymosed. The lobules are surrounded by a rim of injected bloodvessels, and, at their centre, are coloured citron-yellow; they are separated from one another by a dirty grey substance. Towards the sharp margin of the gland, the vascular injection diminishes; the yellow lobules become smaller, and the grey interstitial matter, more abundant.

Fig. 2. Cut surface of the left lobe, in a state of advanced Atrophy. Here, the surface presents a uniform ochre-yellow colour, in which lighter, branched figures can be observed. There is no longer any trace of vascular injection.

Fig. 3. Sediment of Tyrosine deposited spontaneously from the urine of a patient, after standing in the cold air. (Case of Nitschke, Observation XV. Vol. I, p. 202.)

Fig. 4. Residue of a drop of the same urine, after evaporation upon the object-glass. Yellow crystalline masses of Tyrosine, surrounded by globular and membraniform deposits of Leucine.

Fig. 5. Pure Tyrosine obtained by re-crystallisation from the sediment represented in Fig. 3.

Fig. 6. Several lobules of the atrophied liver, represented in Figs. 1 and 2, after injection of the hepatic vein. The yellow injection has become extravasated in the interior of the lobule, without penetrating so far as the terminal branches of the portal vein. Crystals of Leucine are seen in the yellow parenchyma of the lobule, which is surrounded by a ring, formed by a considerable accumulation of fine oil-globules.

Fig. 7. Globules of Leucine tinged with the colouring matter of the urine, from the urine of a Typhus patient.

Fig. 8. Leucine from the Spleen.

a Globular Crystals of Leucine containing lime.

b Crystals of pure Leucine obtained by sublimation.

PLATE IV.

CHRONIC ATROPHY OF THE LIVER.

- Fig. 1. Section of a Liver in the condition of Chronic Atrophy. The parenchyma of the liver is of a uniform brownish-red colour and penetrated by numerous enlarged branches of the portal vein, enveloped in thick, pale-yellow sheaths. The outline of the lobules is indistinct, but finely-granular granulations are observed upon the outer surface. The branches of the hepatic vein present nothing abnormal.
- Fig. 2. Hepatic cells from the same liver.
- a* Small, pale cells, without any granular contents: in a few only is the nucleus visible. Their walls appear collapsed, folded and wrinkled; and consequently, their outlines present an indented appearance. Some of the cells contain dark-brown granules, and others are completely filled with masses of similar granules.
 - b* Brown granules, straight and branched little rods, together with hepatic cells.
 - c* Large flattened epithelium cells with folded walls.
- Fig. 3. Network of vessels from the same liver. The vessels contain brown molecules and cannot be injected; the meshes between them are small, and, at the upper part of the figure, contain a few small, pale-grey hepatic cells. At many places, the meshes have completely disappeared; the capillaries are densely compressed against one another; and the cells, which had been interspersed among them, are destroyed.
- Fig. 4. An injected portion of the same liver. The yellow material injected into the portal vein has only passed into a few of the capillaries; the red substance thrown into the hepatic veins has penetrated farther. In a few only of the capillaries, are the red and yellow injected substances observed to be mixed, so as to produce an orange colour. A large portion of the capillaries of the portal vein are not injected, but are filled with fine brown molecules, the remains of decomposed blood, similar to what is represented on a larger scale in Fig. 3. Owing to the disappearance of the cells, the vascular meshes are smaller than in the normal state.
- Fig. 5. Hepatic cells from another atrophied liver. They are filled, partly with large oil-globules, and partly with brown pigment.
- Fig. 6. Hepatic cells from a liver which has become atrophied by compression. The cells are partly pale and collapsed, and partly filled with brown molecules.
-

P L A T E V.

SENILE ATROPHY AND FATTY-LIVER.

- Fig. 1. Senile atrophy with a limited deposit of fat.
- Fig. 2. A section of the same liver, magnified ten diameters. Isolated, yellowish masses of fatty deposit are observed scattered here and there through the dirty greyish-brown parenchyma. The capillaries of the hepatic veins are hyperæmic.
- Fig. 3. Injected preparation of the same liver. The yellow injection of the ramifications of the portal vein has only penetrated into the capillaries at a few places; close to the portal vessels, the hepatic cells are seen to contain large oil-globules; at the periphery of the lobule, towards the right hand, these globules have been removed by means of ether, and there is consequently an appearance of empty spaces. The capillaries of the hepatic veins are completely injected; the cells in their vicinity are free from fat, but some of them contain pigment.
- Fig. 4. Isolated hepatic cells filled with oil.
- Fig. 5. Deposit of fat in the peripheral cells of the hepatic lobules, accompanied by a new formation of connective tissue, separating different groups of globules from one another.
-

P L A T E VI.

DIFFERENT GRADES OF FATTY-LIVER.

- Fig. 1. Fatty-Liver of a moderate grade. The deposit of fat in the cells is confined to the vicinity of the interlobular veins, which are injected tolerably freely with a yellow material. The cells in the centre of the lobules are free from oil, but contain a quantity of pigment. The intralobular veins are seen filled with a red injection. The oil could be removed from the cells by boiling with ether.
- Fig. 2. A more advanced Fatty-Liver. The injection of both systems of capillary vessels has succeeded perfectly. The ramifications of the portal vein are enveloped in a thick rim of fatty cells, between which the twigs of the vein penetrate. At the upper part is a lobule, with two central veins.
- Fig. 3. Fatty-Liver of an advanced grade. It is only in the immediate vicinity of the central veins that small groups of hepatic cells, containing pigment, but free from oil, are still visible. The remaining cells were filled with oil, and were removed by boiling in ether, so that the meshes formed by the vessels are all that remain.
-

P L A T E VII.

FATTY-LIVER OF THE MOST ADVANCED GRADE.

- Fig. 1. Cut surface of a Fatty-Liver of the most advanced grade, magnified ten diameters. The parenchyma is coloured pale-yellow. The branches of the hepatic veins, which have been divided in various directions, form a reddish-brown network, whilst the twigs of the portal vein are only visible as delicate linear ramifications. At some places, and especially at the origin of the hepatic veins, a deep yellow tint is observable, which is produced by an accumulation of bile-pigment.
- Fig. 2. An injected portion of the same liver. The capillaries are almost perfectly injected; the red substance thrown into the hepatic vein has penetrated the entire lobule, as far as the yellow ramifications of the portal vein.
- Fig. 3. A portion of the same liver, from which the fat and the glandular cells have been separated by boiling in ether. The figure represents the reticulum composed entirely of connective tissue containing the bloodvessels, which are here only slightly injected.
- Fig. 4. Cut surface of an Atrophied Pigment-Liver, magnified ten diameters. The parenchyma is dark-grey; the ramifications of the hepatic veins are of a dark reddish-brown colour, whilst the parts surrounding the fine branches of the portal vein are paler, and present a grey, punctated appearance.
- Fig. 5. A small mass of decomposed bile, from a sacculated enlargement of the bile-duct of a fatty-liver. Numerous crystals of hæmatoidine are observed in the amorphous yellowish-brown basis.
- Figs. 6 and 7. Bile-pigment from jaundiced blood.
6. In the form of brown angular granules.
 7. In the form of short rods, which are arranged in rows, or aggregated into radiated crystalline masses.
-

P L A T E V I I I.

HYPERTROPHIED AND HYPERÆMIC FATTY-LIVER.

- Fig. 1. Hypertrophied Fatty-Liver, magnified ten diameters. Groups of lobules are separated from one another by large branches of the portal vein with thickened sheaths. In the lobules themselves, the branches of the hepatic veins are somewhat hyperæmic, and surrounded by greyish-yellow rims, formed of fatty hepatic cells.
- Fig. 2. An injected portion of the same liver, magnified 280 diameters. The hepatic cells are, for the most part, normal, except in the neighbourhood of the hepatic veins, where they contain large oil-globules.
- Fig. 3. Hyperæmia of the liver, with a partial deposit of fat, from an individual with incompetence of the mitral valves, magnified ten diameters. The dark portions correspond to the situation of the hepatic veins; the lighter spaces, to that of the portal vein. The form of these last is round, oval, elongated, divided dichotomously, or much branched, according to the direction in which the vessels are divided by the section. The fundamental colour of the liver is for the most part yellow, from the retention of bile-pigment; at some places it is greenish, except in the immediate neighbourhood of the branches of the portal vein, where it is pale-grey. Here and there may be observed large grey islets, in which the cells are free from pigment and oil. The latter substance was found in abundance in the yellow spaces.
- Fig. 4. An injected portion of the same liver, magnified 280 diameters. The cells in the vicinity of the portal vein (injected yellow) are normal in character. On the other hand, the cells surrounding the hepatic veins (injected red) contain bile-pigment and an abundance of fine oil-globules.
-

PLATE IX.

THE PIGMENT-LIVER. MELANÆMIA AND ITS EFFECTS UPON THE LIVER. CHARACTERS OF THE LIVER IN COMPLICATED INTERMITTENT FEVER.

- Fig. 1. Section of a melanæmic liver. The organ has a chocolate-coloured appearance. Reddish-brown figures corresponding to the hepatic veins, which are somewhat hyperæmic and loaded with bile-pigment, may be observed scattered through a greyish-black basis.
- Fig. 2. Pigment-matter from the portal vein.
- a* From the trunk of the portal vein. Epithelium-cells from the lining membrane of the vessel containing black pigment, some of them with a distinct nucleus of a spindle-shaped or rounded form; the younger cells are coloured reddish-brown. Normal blood-corpuscles.
 - a'* From the splenic vein.
 - b* Cylindrical scales (Schollen), containing pigment.
 - c* Large coagula loaded with black pigment from the splenic vein. (See Vol. I, p. 321.)
- Fig. 3. Fine section of a pigment-liver previously boiled and treated with a solution of potash, magnified 280 diameters. The pigment is deposited in the capillaries between the hepatic cells, as far as the central vein. (See Vol. I, p. 317.)
- Fig. 4. Fine section of another liver treated in the same manner, magnified 90 diameters. The pigment is seen to be deposited for the most part in the interlobular veins, forming a black zone surrounding each lobule, and to have penetrated but very slightly into the interior of the lobules. (Case of Krockner, Observation XLIII. Vol. I, pp. 318 and 350.)
- Fig. 5. An injected melanæmic liver, from a patient, who died ten weeks after the cessation of an attack of Intermittent Fever. The portal veins which are filled with yellow injection, are enlarged as far as their entrance into the lobules, where they terminate in a club-shaped manner; their capillary prolongations are but imperfectly injected, owing to some of them being filled with pigment and obliterated. The capillaries of the hepatic vein, which are filled with red injection, present nothing abnormal. The hepatic cells are impregnated with bile-pigment.

PLATE X.

MELANÆMIA AND ITS EFFECTS UPON THE BRAIN, THE KIDNEYS AND THE LIVER.

- Fig. 2. Section of the cerebellum, from a case of Melanæmia. The deposit of pigment is most marked in the cortical substance; but vessels of a blackish tinge may be observed in the white substance also.
- Fig. 1. Capillaries containing pigment from the brain of the same case, magnified 150 diameters.
- Fig. 3. A capillary vessel, magnified 280 diameters. The particles of pigment appear surrounded by a brown rim.
- Fig. 4. A coagulum of blood from the Vena fossae Sylvii. It is seen to consist of normal blood-corpuscles, together with isolated, and aggregated masses of pigment-granules.
- Figures 3 and 4 are drawn from old preparations and represent, to some extent, post mortem changes.
- Fig. 5. A glomerulus of the Kidney, with its capsule reflected. Numerous pigment-scales are seen in the interior of the capillaries.
- Fig. 6. Atrophy of the Liver resulting from Intermittens melanaemica, six months after the commencement of the intermittent fever. The branches of the portal vein are enlarged; only a few of its capillaries could be injected; most of them are obliterated and contain pigment. The surrounding hepatic cells are partly atrophied, and partly, in a state of fatty degeneration; at some places, the parenchyma is infiltrated with lardaceous (speckig) matter. The capillaries of the hepatic veins are filled with red injection and in a more normal condition.
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P L A T E X I.

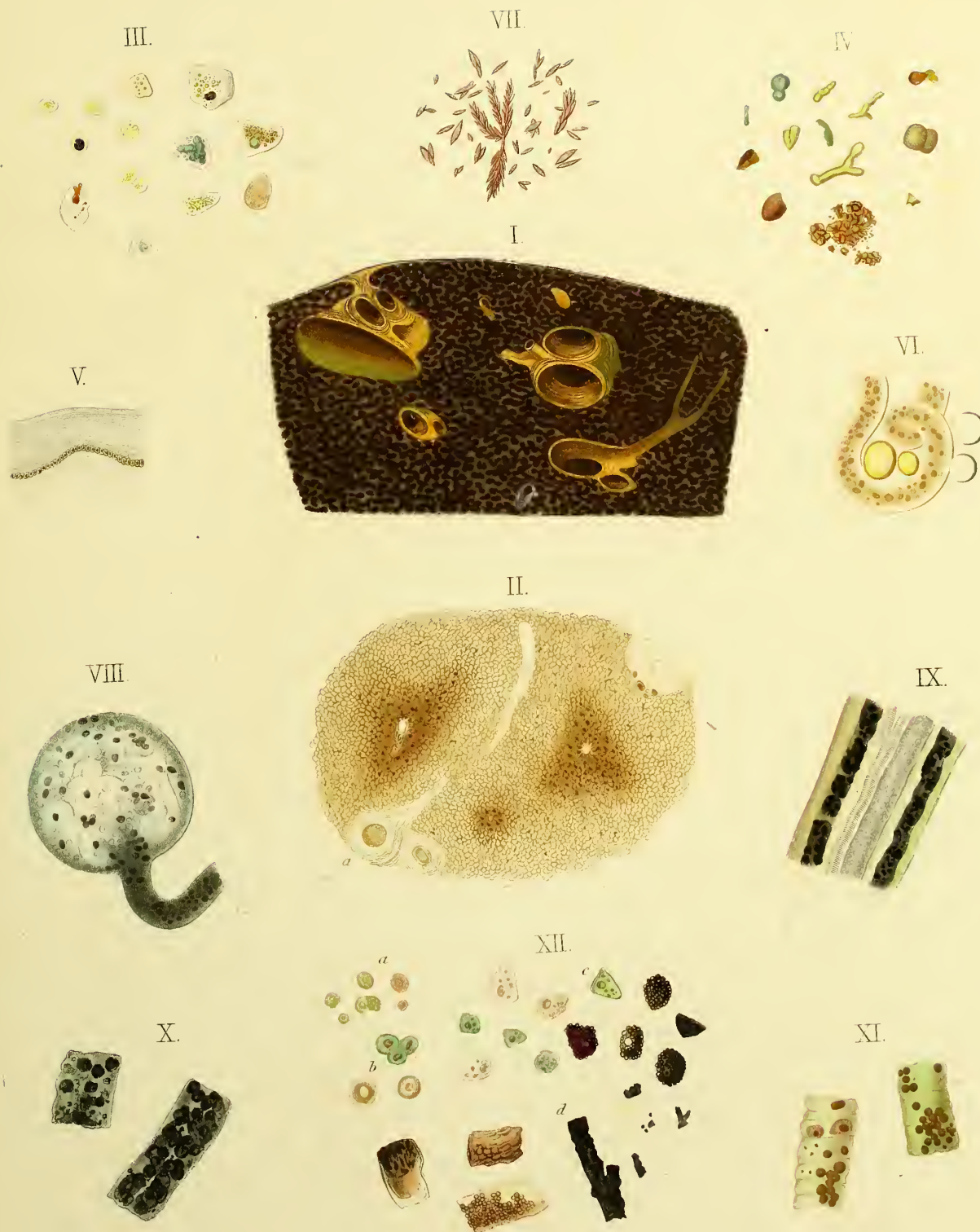
PIGMENT-LIVER IN FEBRIS INTERMITTENS MELANÆMICA. PIGMENT IN THE
HEPATIC ARTERY.

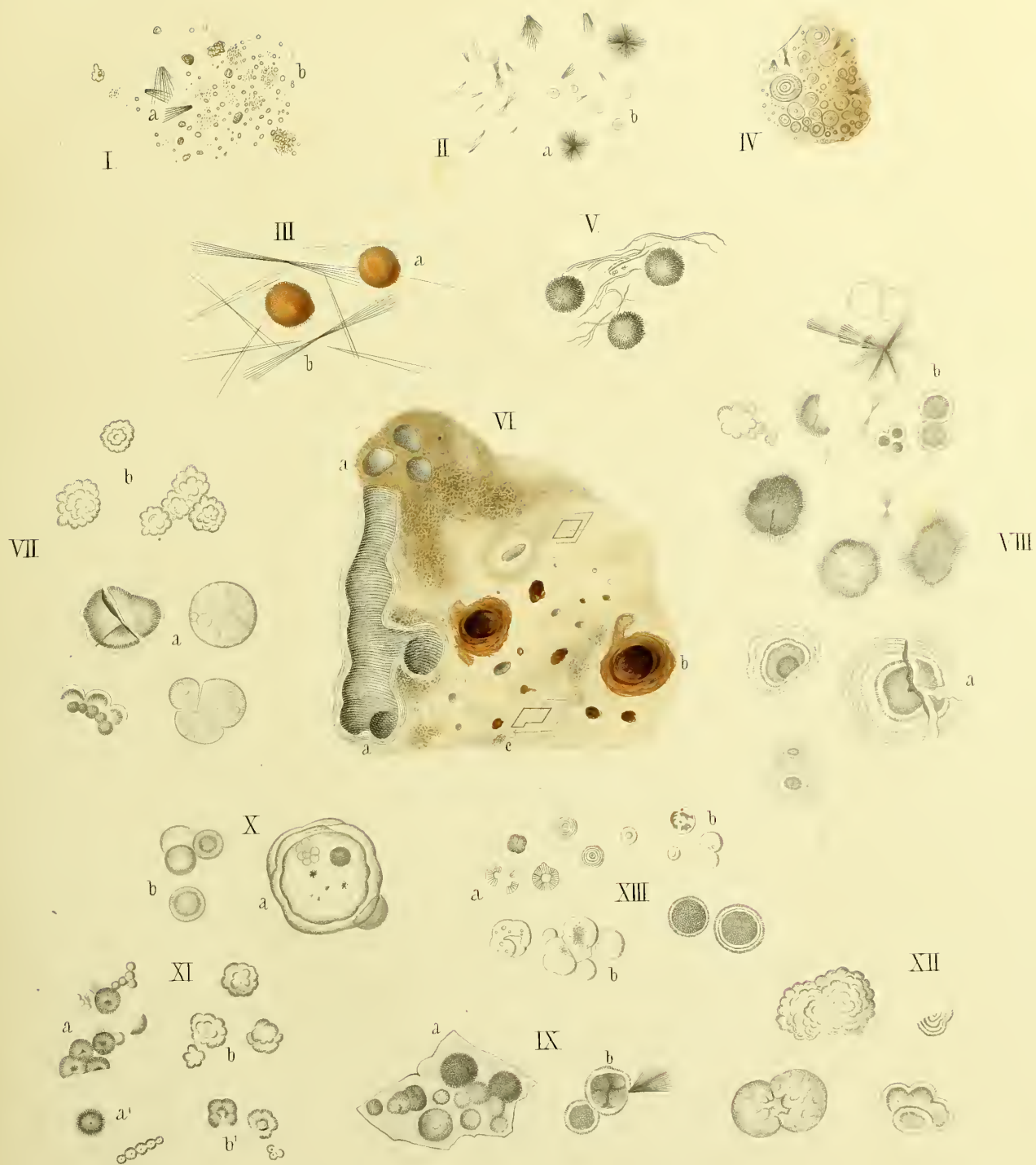
- Fig. 1. Complete injection of a liver loaded with pigment, magnified 280 diameters. The portal vein (*A*) is injected with yellow material; the hepatic vein (*B*) with red; and the hepatic artery (*C*) with blue. Everywhere throughout the capillary network may be observed accumulations of pigment, which however do not fill up the calibre of the vessels, or interfere with the passage of the injection. The distribution of the pigment is not uniform, inasmuch as it occurs in greater abundance in the roots of the hepatic veins towards the centre of the lobules. The hepatic artery is very rich in pigment: at some places, where the vessel is divided transversely, it is almost completely filled.
- Fig. 2. The same injected liver magnified ten diameters. The blue hepatic artery, dotted with black pigment, is observed everywhere accompanying the yellow portal vein. The injection of the three systems of bloodvessels has been unusually successful.
- Fig. 3. The same liver, without injection, magnified ten diameters. The surface presents a dark greyish-black colour, which is most developed in the tracts (zones) of the hepatic vein, those of the portal vein having a paler aspect. The branches of the portal vein are represented paler, and may be observed to be everywhere accompanied by the black twigs of the hepatic artery.
-

PLATE XII.

HYPERÆMIA OF THE LIVER IN DISEASES OF THE HEART.

- Fig. 1. Section of a hyperæmic liver, from the body of an individual who had suffered from incompetence of the tricuspid valves. The hepatic veins are filled with blood, and form figures connected at some places with one another, but separated, at others, by the pale yellow hepatic parenchyma. At some parts, the hyperæmia extends to the ramifications of the portal vein, and the parenchyma appears of a uniform dark-red colour; but, even here, the more fully distended branches of the hepatic veins may be distinguished in the form of reddish-black figures.
- Fig. 2. A slighter grade of hyperæmia of the liver, from an individual who died asphyxiated, in consequence of lateral distortion and emphysema of the lungs. A hyperæmic Nutmeg-Liver. The region of the hepatic veins is filled with blood and presents rounded, or still oftener, branched (once or many times), dark figures, whilst that of the portal vein appears pale and only exhibits linear ramifications.
- Fig. 3. The same section, magnified ten diameters. The fine twigs of the hepatic veins are filled with black coagulated blood, which had regurgitated from the vena cava; the tissue surrounding them is coloured reddish-brown; the figures formed by these vessels are rarely round, but are more commonly stellate or of the form of an oak-leaf. The branches of the portal vein are of a paler red hue; the tissue surrounding their linear ramifications is of a pale yellowish-brown colour.
- Fig. 4. An injected portion of the same liver, more highly magnified. The hepatic vein, which is injected red, exhibits an extensive network of capillaries, the breadth of which is considerably increased above that of the normal condition. In consequence of this enlargement, the spaces for the hepatic cells in the neighbourhood of the central veins of the lobules are much narrowed; at some places they are smaller than the calibre of the vessels. In this way, the dilatation of the capillary vessels has occasioned a partial atrophy of the hepatic cells.
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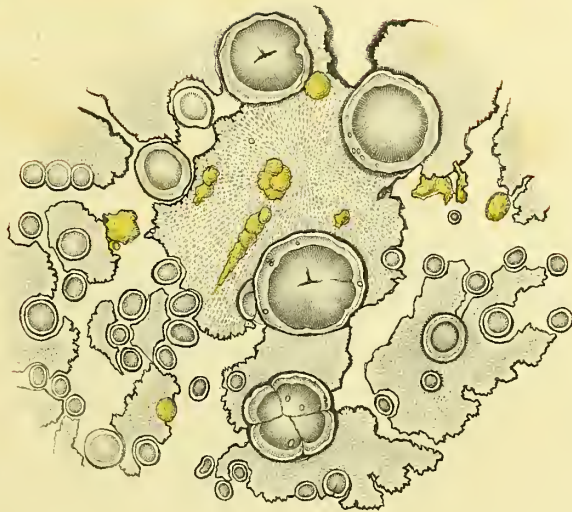
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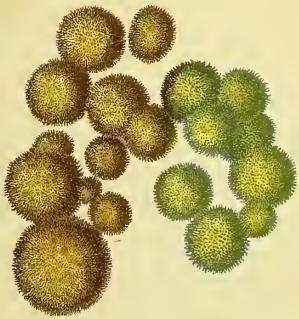
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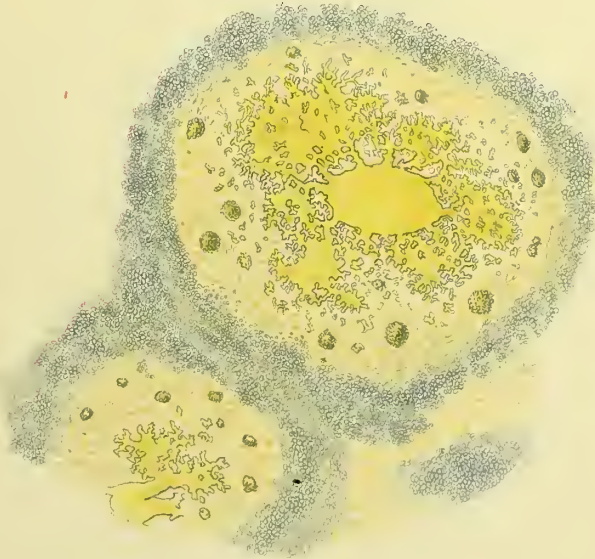
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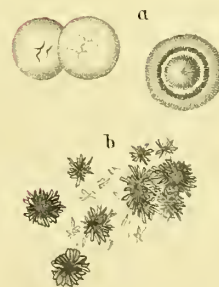
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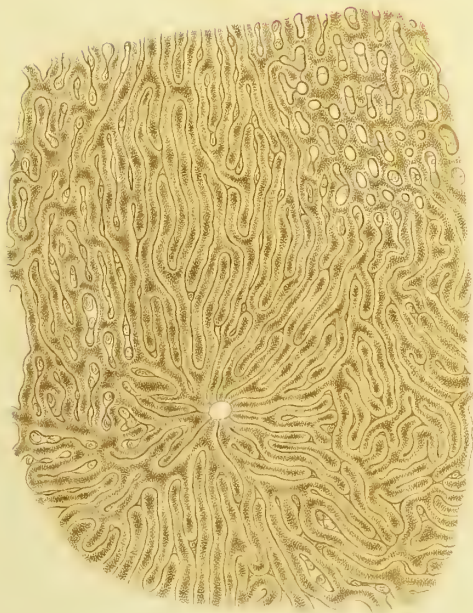


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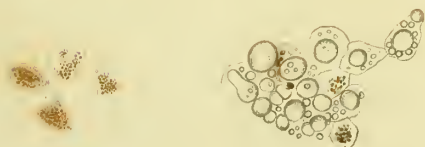
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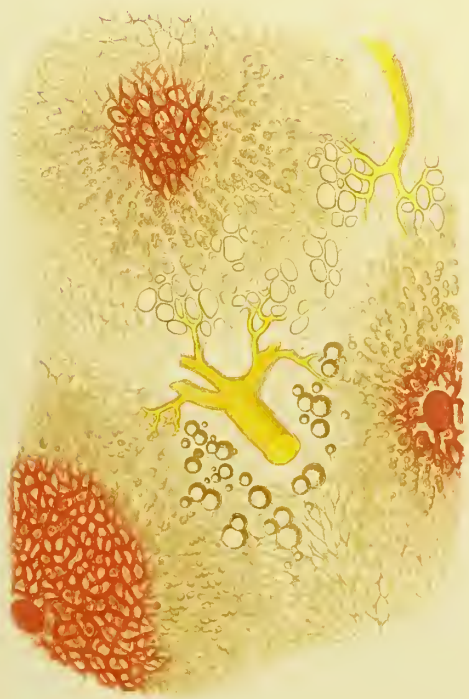
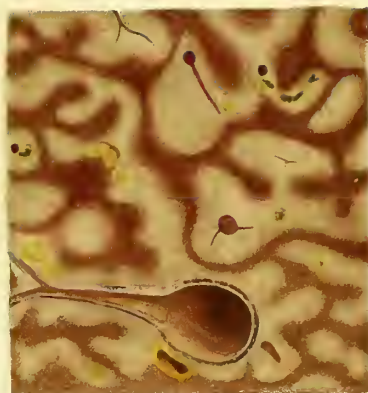
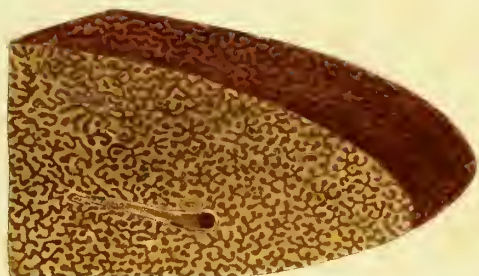
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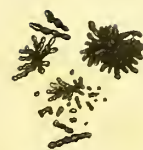
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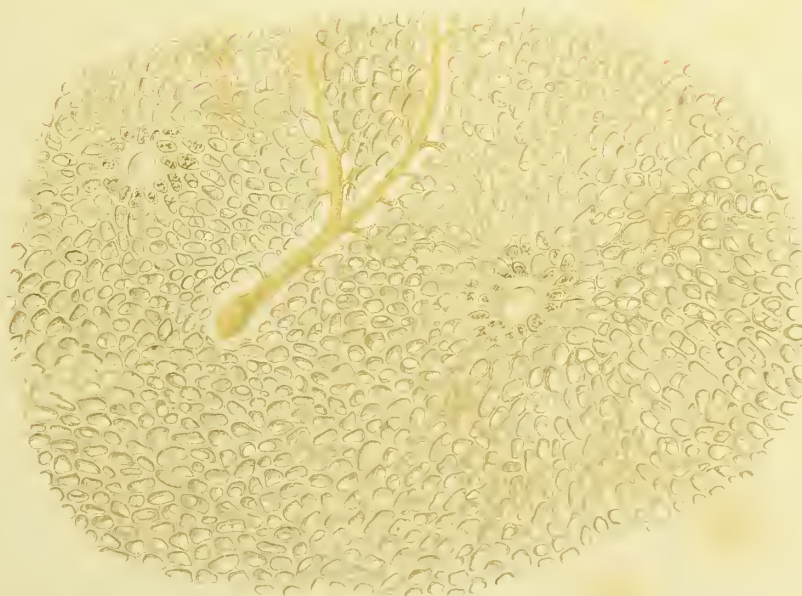
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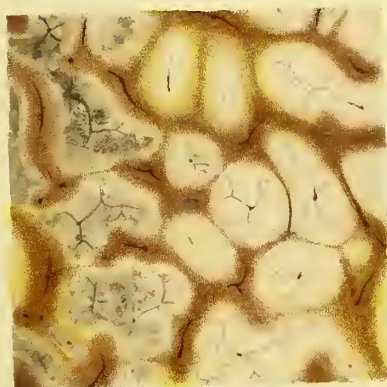
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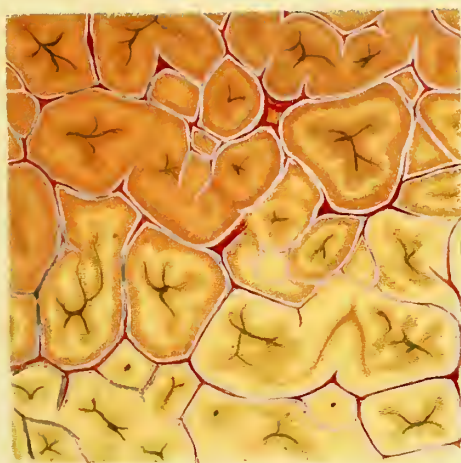
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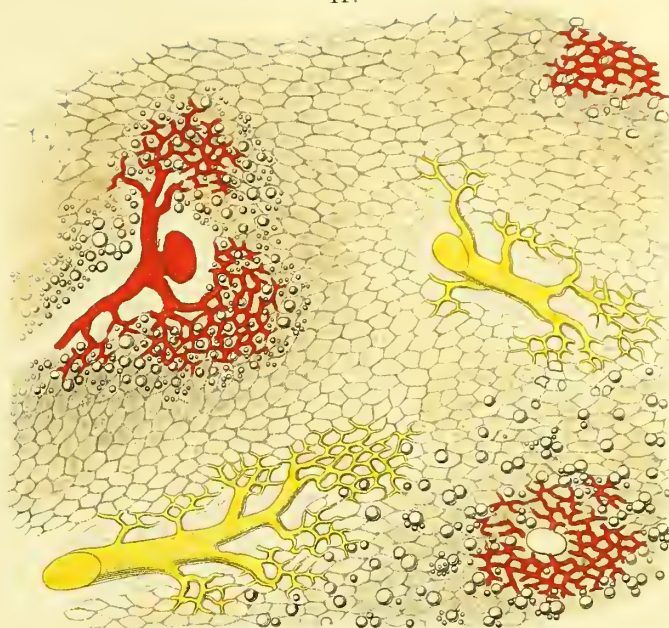
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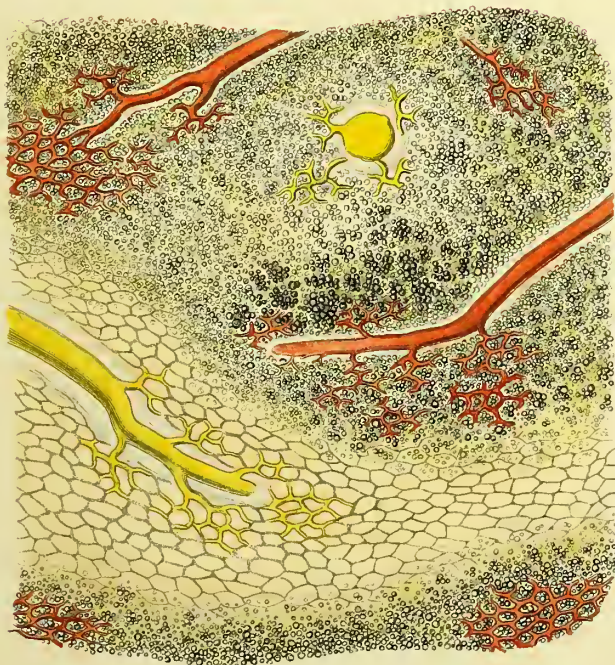
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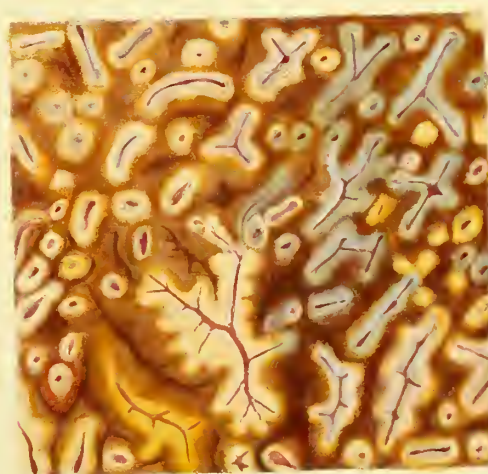
II.



IV.

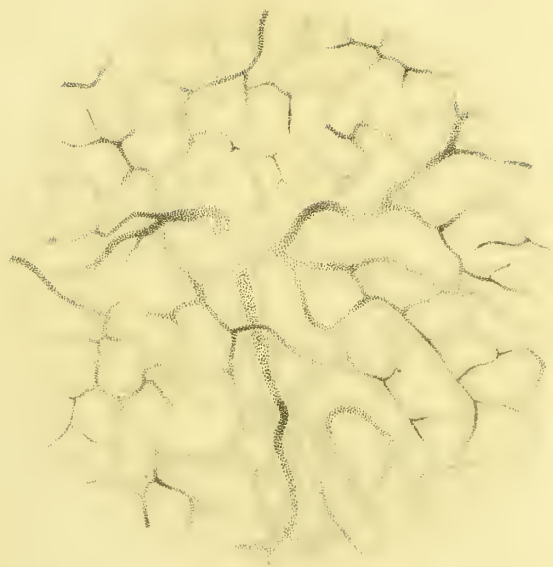


III.





I

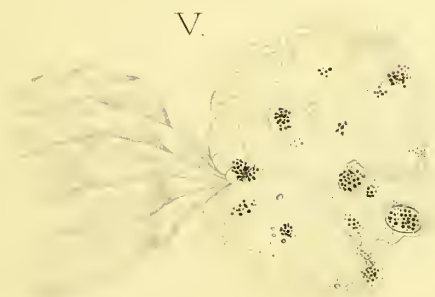


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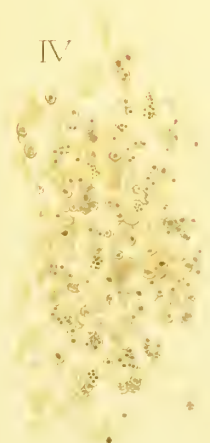
II



V



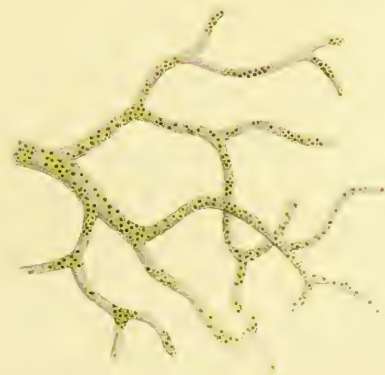
IV



VI



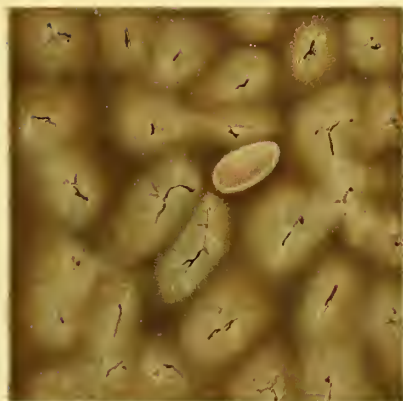
III



I.



III.



II.

